



ASSESSMENT OF THE RELATIONSHIP BETWEEN STRESS LEVEL, FATIGUE SYMPTOMS, AND SLEEP QUALITY WITH ORAL HEALTH BEHAVIOR AMONG DENTAL STUDENTS – OBSERVATIONAL ANALYTICAL STUDY

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ABSTRACT

Background: Stress is a complicated condition with biological components that can influence a person's regular sleep cycle, while sleep problems are strongly linked to serious physical, psychological, and social abnormalities. Also, stress-prone individuals frequently experience physical ailments that can wreak havoc on their oral and dental health. **Aim & Objectives:** The present study was aimed to assess the relationship between stress level, fatigue symptoms, and sleep quality with oral health behaviour among 500 dental students who are willing to participate in the study. **Materials & Methods:** After taking the informed consent, the students were subjected to respond to 4 questionnaires namely Perceived Stress Scale, Fatigue Assessment Scale, Pittsburgh sleep quality Index (PSQI) and questionnaire that assessed oral health behaviours of the participants. The collected Data was tabulated and analysed statistically using SPSS software version 23. **Results:** The obtained results showed High levels of stress, fatigue symptoms, poor sleep quality in Group II 77(36.7%), 87(33.0%), 32(32.3%) respectively. **Conclusion:** It can be concluded that disturbed sleep, more fatigue is pressing a negative impact on the oral health of dental students.

KEYWORDS : dental students, fatigue, oral health, sleep, stress

INTRODUCTION

Stress is a complex condition with emotional, cognitive, and biological factors which may affect normal sleep pattern while the sleep disorders are closely associated with significant medical, psychological and social disturbances.

The most common stress-related symptoms affecting mental health can include sleep disorders, depressed mood, sadness, anxiety, irritability, concentration and memory disorders, chronic fatigue syndrome, anorexia and bulimia.¹

The high-stress levels can cause sleep disturbance and problems related to sleep disturbance that is relevant in a modern society with a prevalence of insomnia-related symptoms among young adults is approximately 70%.²

A much-discussed topic in medicine and psychology is fatigue, which is considered to be the main component of chronic fatigue syndrome and burnout syndrome. Not only insomnia, but irregular lifestyle, physical illness, socio-demographic factors all are the causal risk factors for fatigue.³ There is a possibility that stress, fatigue or sleep disturbances can disrupt the daily oral health behaviour.

Hence the purpose of this study was to determine the associations of the stress level, fatigue symptoms, and sleep quality with oral health behaviour among the dental students. Hence this study was aimed to assess the relationship between stress level, fatigue symptoms, and sleep quality with oral health behavior among dental students.

MATERIALS & METHODS:

This analytical cross-sectional study was conducted among the dental students of Coastal Andhra Pradesh region. The objectives were clearly explained to the students and consent is obtained from them. The respondents were divided into 4 groups:

Group I: 1ST and 2ND year undergraduate dental students (Pre-clinical)
Group II: 3RD and 4TH undergraduate dental students (Clinical)
Group III: Interns
Group IV: Post-Graduate Students

Data collection was done by using self-administered questionnaire containing Perceived Stress Scale (PSS), Fatigue assessment scale (FAS), Pittsburgh sleep quality Index (PSQI), Questionnaire related to Oral health behaviour. The Perceived Stress Scale (PSS) is the most widely used psychological instrument for measuring the perception of stress. The questions in the PSS ask about feelings and thoughts during the last month. In each case, respondents are asked how often they felt a certain way.⁴

The Fatigue Assessment Scale consists of ten statements that refers to how a respondent usually feel where the respondent can choose one out of five answer categories, varying from Never to Always.⁵

The Pittsburgh Sleep Quality Index (PSQI) is designed to evaluate overall sleep quality. Each of the questionnaire's 19 self-reported items. Scores for each question range from 0 to 3, with higher scores indicating more acute sleep disturbances.⁶

Oral health behaviour questionnaire included questions that are related to the oral health behaviour and oral health status.⁷

Ethical clearance to conduct the study was obtained from the Institutional Ethical Committee (IEC). The data was statistically analyzed and tabulated by using Chi square test with SPSS version 23 where the $p < 0.05$ was considered as statistically significant.

RESULTS:

A total of 502 students participated in the study out of which 119

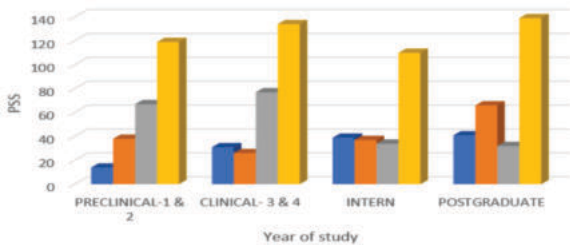
(23.7%) were preclinical students (Group I), 134 (26.7%) were clinical students (Group II), 110 (21.9%) were Interns (Group III) and 139 (27.7%) were Post graduate students (Group IV).

Graph I showed that high stress level was more commonly found which was seen in 210 (41.8%) students compared to the moderate and normal stress level.

The number of students with high-stress level in group II is 36.7% which was highest amongst the 4 groups. Based on the fatigue assessment scale, 264 students (52.5%) reported that they have fatigue symptoms and the highest number was in group II (graph 2) which was 33%.

PSIQ revealed sleep disturbance is less common with 403 (80.2%) students having good sleep quality where as in the students with poor sleep quality showed that the highest number of sleep disturbance was seen in group II (graph 3) which was 32.3%.

PSS and Year of study



Graph 1: Distribution of Stress from the scores obtained through Perceived Stress Scale among the 4 groups.

Table I shows the relationship between stress level, fatigue symptoms and sleep quality with the oral health behaviour of the students. A p value of < 0.001 which is statistically significant has been obtained for students who have tooth brushing frequency of once a day 125(59.5%), flossing

Table 1: Relationship between stress, fatigue symptoms and sleep quality with frequency of daily tooth brushing and flossing

VARIABLES	Daily tooth brushing frequency		Flossing frequency				
	once a day	twice a day	never	once a month	once a week	more than once a week	everyday
PSS							
Normal	35(28.0%)	90(72.0%)	42(33.6%)	29(23.2%)	21(16.8%)	22(17.6%)	11(8.8%)
Moderate	107(64.1%)	60(35.9%)	96(57.5%)	15(9.0%)	24(14.4%)	13(7.8%)	19(11.4%)
High	125(59.5%)	85(40.5%)	110(52.4%)	29(13.8%)	33(15.7%)	13(6.2%)	25(11.9%)
P- Value	0.000*	0.000*					
FAS							
No Fatigue	119(50.0%)	119(50.0%)	124(52.1%)	33(13.9%)	27(11.3%)	27(11.3%)	27(11.3%)
Fatigue	148(56.1%)	116(43.9%)	124(47.0%)	40(15.2%)	51(19.3%)	21(8.0%)	28(10.6%)
P- Value	0.174	0.112					
PSQI							
Good Sleep	216(53.6%)	187(46.4%)	208(51.6%)	57(14.1%)	59(14.6%)	36(8.9%)	43(10.7%)
Poor Sleep	51(51.5%)	48(48.5%)	40(40.4%)	16(16.2%)	19(19.2%)	12(12.1%)	12(12.1%)
P- Value	0.710	0.367					

There is highly significant correlation of fatigue symptoms with last dental visit which is < one month 106(40.2%), satisfaction by appearance of own teeth 180 (68.2%), where p value is 0.000.(table 2)

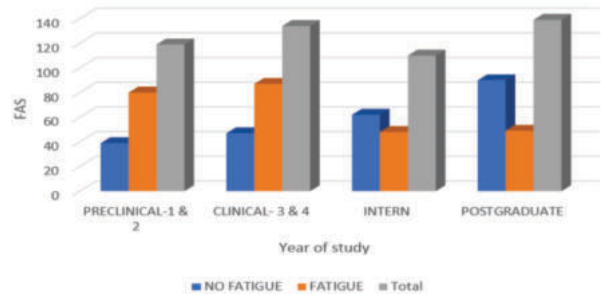
Table 2: Relationship between stress, fatigue symptoms with last dental visit and reason for dental visit.

VARIABLES	Last dental visit				Reason for dental visit				
	< 1 months ago	1-12 months ago	1-2 years ago	> than 2 years ago	check up	others	pain	tooth cleaning/ scaling	treatment needed
PSS									
Normal	63(50.4%)	39(31.2%)	13(10.4%)	10(8.0%)	56(44.8%)	3(2.4%)	14(11.2%)	12(9.6%)	40(32.0%)
Moderate	99(59.3%)	18(10.8%)	23(13.8%)	27(16.2%)	47(28.1%)	14(8.4%)	11(6.6%)	65(38.9%)	30(18.0%)
High	82(39.0%)	42(20.0%)	26(12.4%)	60(28.6%)	47(22.4%)	46(21.9%)	13(6.2%)	52(24.8%)	52(24.8%)
P-Value	0.000*	0.000*							
FAS									
No Fatigue	138(58.0%)	50(21.0%)	23(9.7%)	27(11.3%)	84(35.3%)	19(8.0%)	15(6.3%)	66(6.3%)	54(22.7%)
Fatigue	106(40.2%)	49(18.6%)	39(14.8%)	27(11.3%)	66(25.0%)	44(16.7%)	23(8.7%)	63(23.9%)	68(25.8%)
P-Value	0.000*	0.007							

A significant correlation between sleep quality and self-reported gingival bleeding 22(22.1%) where p<0.001 has been observed. (table 3 & 4)

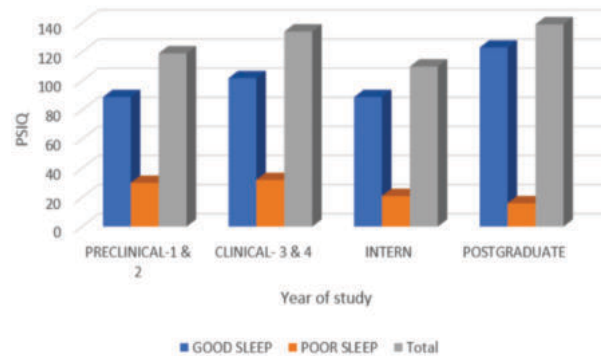
frequency of once a week 33(15.7%), last dental visit of < one month 89(30.0%), reason for dental visit as tooth cleaning/ scaling 52(24.8%) students having gum bleeding 33(15.7%) normal gingival condition 118 (56.2%) have high stress levels.

FAS and year of study



Graph 2: Distribution of Fatigue symptoms from the scores obtained through Fatigue Assessment Scale among the 4 groups.

PSQI and year of study



Graph 3: Distribution of Sleep Quality from the scores obtained through Pittsburgh sleep quality Index among the 4 groups.

Table 3: Relationship between stress, fatigue symptoms and sleep quality with self-reported gingival condition and tooth ache last time.

VARIABLES	Self-reported gingival condition				Toothache last time				
	Excellent	Normal	Poor	Very good	Do not remember	During last 3 months	During last year	Last week	more than a year ago
PSS									
Normal	2(1.6%)	88(70.4%)	3(2.4%)	32(25.6%)	45(36.0%)	3(2.4%)	21(16.8%)	0(0.0%)	56(44.8%)
Moderate	18(10.8%)	58(34.7%)	5(3.0%)	86(51.5%)	109(65.3%)	7(4.2%)	6(3.6%)	7(4.2%)	38(22.8%)
High	30(14.3%)	118(56.2%)	10(4.8%)	52(24.8%)	114(54.3%)	23(11.0%)	17(8.1%)	22(10.5%)	34(16.2%)
P-value	0.000*	0.000*							
FAS									
No Fatigue	18(7.6%)	119(50.0%)	5(2.1%)	96(40.3%)	128(53.8%)	3(1.3%)	22(9.2%)	8(3.4%)	77(32.4%)
Fatigue	32(12.1%)	145(54.9%)	13(4.9%)	74(28.0%)	140(53.0%)	30(11.4%)	22(8.3%)	21(8.0%)	51(19.3%)
P-Value	0.009	0.000*							
PSQI									
Good Sleep	34(8.4%)	213(52.9%)	13(3.2%)	143(35.5%)	223(55.3%)	22(5.5%)	33(8.2%)	19(4.7%)	106(26.3%)
Poor Sleep	16(16.2%)	51(51.5%)	5(5.1%)	27(27.3%)	45(45.5%)	11(11.1%)	11(11.1%)	10(10.1%)	22(22.2%)
P-value	0.069	0.031							

Table 4: Relationship between stress, fatigue symptoms and sleep quality with oral health behaviour parameters.

VARIABLES	Current non-treated dental caries		Current extracted teeth		Satisfaction by appearance of own teeth		Self-reported gum bleeding	
	no	yes	no	yes	no	yes	no	yes
PSS								
Normal	92(73.6%)	33(26.4%)	107(85.6%)	18(14.4%)	12(9.6%)	113(90.4%)	125(100%)	0(0.0%)
Moderate	133(79.6%)	34(20.4%)	146(87.4%)	21(12.6%)	29(17.4%)	138(82.6%)	155(92.8%)	12(7.2%)
High	158(75.2%)	52(24.8%)	178(84.8%)	32(15.2%)	64(30.5%)	146(69.5%)	177(84.3%)	33(15.7%)
P- Value	0.435		0.759		0.000*		0.000*	
FAS								
No Fatigue	195(81.9%)	43(18.1%)	217(91.2%)	21(8.8%)	21(8.8%)	217(91.2%)	234(98.3%)	4(1.7%)
Fatigue	188(71.2%)	76(28.8%)	214(81.1%)	50(18.9%)	84(31.8%)	180(68.2%)	223(84.5%)	41(15.5%)
P-Value	0.005		0.000*		0.000*		0.000*	
PSQI								
Good Sleep	314(77.9%)	89(22.1%)	358(88.8%)	45(11.2%)	66(16.4%)	337(83.6%)	380(94.3%)	23(5.7%)
Poor Sleep	69(69.7%)	30(30.3%)	73(73.7%)	26(26.3%)	39(39.4%)	60(60.6%)	77(77.8%)	22(22.2%)
P-Value	0.085		0.000*		0.000*		0.000*	

DISCUSSION:

Stress, fatigue and sleep disturbances are closely related to each other and might be induced by various individual as well as environmental risk factors. Despite numerous possible reasons, the examination period was seen as the most common and the most important reason for the increase of fatigue, stress and sleep disturbances which could be attributed to necessary additional efforts.⁸

Renate Dienzer et al. 2005 the Oral health habits like daily mouth rinsing, flossing, tooth brushing frequency and gum bleeding are significantly (p value of < 0.001) associated with high stress level. There was highly significant (p value of 0.000) correlation of fatigue symptoms with last dental visit which is less than one month 106(40.2%), satisfaction by appearance of own teeth 180(68.2%), coinciding the findings by Kailash Asawa et al. 2017.⁷

Gilbert et al. in 2010 found that the average number of sleep hours in a sample of 557 undergraduate Introductory Psychology students was 7.2±1.2, which is congruent with our research findings that the mean number of sleep hours at night for all students was 7.17±1.34 and the average PSQI score was 2.63±2.08.¹⁰ On the other hand, it is contrary to the study done by Elagra et al. in 2016 on dental students of Riyadh Colleges of Dentistry and Pharmacy, where the authors found the mean sleep duration to be less (5.85±1.853) and PSQI average score to be high (7.6±3.396) where as in the current study there was a significant (p<0.001) correlation between sleep quality and self reported gingival bleeding 22(22.1%).¹¹

This study reveals that the percentage of stress level, fatigue symptoms, sleep quality effect the oral health behaviour among the dental students mostly in group II.

This study also shows that the fatigue and sleep quality symptoms also have a significant association with oral health-related

behavior which are coinciding with Dumitrescu et al. 2008.³

The association of stress with oral health behaviour is novel or atleast least addressed, while our findings generally support other studies indicating a positive association between stress and poor oral health.

CONCLUSION

The present study has shown significant association between stress, sleep and fatigue with self-reported oral health status among Indian dental students. Oral health habits like daily mouth rinsing and flossing were significantly associated with stress, sleep, and fatigue. Students who have good oral health were less stressed, had good sleep and less fatigue. Disturbed sleep and more fatigue were reported to be the reasons for being stressed. The study confirms that disturbed sleep, more fatigue and is pressing a negative impact on the oral health of dental students.

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